Characterization of immune responses to human polyomavirus MCPyV

There have been considerable increase in number of known human polyomaviruses in recent years; currently we register twelve of them. Presumably, majority of human polyomaviruses cause lifelong persistent infection. Primary infection is usually asymptomatic and is followed by appearance of antibodies specific to polyomavirus capsid. Polyomaviruses can cause complication especially in immunocompromised people. Merkel cell polyomavirus (MCPyV) is linked to development o of Merkel cell carcinoma (MCC). Although this skin tumor is very rare, MCPyV infection is very common. Most of the human population exhibit MCPyV-specific antibodies in serum. MCPyV specific antibodies are detected in patients with MCC and their level is generally higher than in healthy individuals. MCC occurs more often in immunosuppressed individuals. It appears that protection of antibodies against tumor formation is not sufficient and the development of the tumor could be rather under the control of cellular immunity.

In this study, we have prepared plasmids for production of major capsid protein VP1 and detection of antibodies specific to MCPyV capsids. Mice immunized with DNA vaccine expressing VP1 protein produced VP1 specific antibodies in serum. From insect cells infected with recombinant baculovirus expressing VP1 protein we isolated virus like particles (VLPs). They were used for the determination of specific antibodies MCPyV in sera of healthy individuals by ELISA. Viral load in skin swabs and tonsillar washes was determined in these individuals by real-time PCR. The other aim of this study was to measure the cellular immune response to the antigens derived from proteins VP1 and LT MCPyV by ELISPOT. For detection of immune response to LT antigen we prepared plasmid suitable for in vitro transcription of LT mRNAs and their electroporation into dendritic cells.

Key words: human polyomavirus, Merkel cell polyomavirus, antibodies, cell immunity